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*An invited talk*

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## **Invited Speaker**

### **Effect of transition metal oxides on the structure and functions of the microporous amorphous silica-based membrane**

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Hydrothermal stability is crucial for efficient applications of microporous silica-based membranes in a long term. It is already known that microporous transition metal doped silica membranes are hydrothermally more stable than pure silica membranes, but less selective and permeable. Here we present a detailed study on the impact of the type and content of the transition metal ions on the structural stability, selectivity and permeability of amorphous silica-based membranes. We investigate the structural stability of the membranes by performing systematic thermal treatments. The amorphous structure of the membrane materials is characterized using the nuclear magnetic resonance spectroscopy. Both the glass transition and the degree of disorder in the membrane materials are determined using a differential scanning calorimeter and an X-ray diffractometer, respectively. The results will be useful for optimizing the chemical composition and synthetic route of the transition metal doped membrane in terms of structure stability and porosity.